WHAT IS CLAIMED IS:

1. A method of associating a polymer with the sidewalls of a plurality of individual single-wall carbon nanotubes, comprising:

(a) providing a purified single-wall carbon nanotube material substantially free of amorphous carbon;

(b) dispersing said single-wall carbon nanotube material in the polymer by a combination of high-shear mixing and ultrasonication;

(c) adding salt to bring the solution to a desired concentration of salt by weight;

(d) centrifuging the solution;

(e) decanting the solution;

(f) redispersing the material in water by mechanical agitation; and

(g) passing the material through at least one filter.

2. The method in accordance with claim 1, wherein the salt is selected from the group consisting of an alkali metal salt and an alkaline earth metal salt.

3. The method in accordance with claim 2, wherein the salt is sodium chloride.

4. The method in accordance with claim 1, further comprising applying a high-gradient magnetic field to the material to remove ferromagnetic particles.

5. The method in accordance with claim 1, wherein said dispersing step (b) comprises dispersing said single-wall carbon nanotube material in at least about 1% polystyrene sulfonate in water.

6. The method in accordance with claim 3, wherein the concentration of sodium chloride is at least about 10%.

7. The method in accordance with claim 1, wherein said centrifuging step (d) comprises centrifuging at least about 60,000 g for at least about 20 minutes.

8. The method in accordance with claim 1, wherein the polymer is an amphiphilic polymer

9. A method in accordance with claim 1, wherein the polymer is selected from the group consisting of: polyvinyl pyrrolidone (PVP), polystyrene sulfonate (PSS), poly(1-vinyl pyrrolidone-co-vinyl acetate) (PVP/VA), poly(1-vinyl pyrrolidone-coacrylic acid), poly(1-vinyl pyrrolidone-co-dimethylaminoethyl methacrylate), polyvinyl sulfate, poly(sodium styrene sulfonic acid-co-maleic acid), dextran, dextran sulfate, bovine serum albumin (BSA), poly(methyl methacrylate-co-ethyl acrylate), polyvinyl alcohol, polyethylene glycol, and polyallyl amine.

10. The method in accordance with claim 1, wherein the single-wall carbon nanotubes are coated with at least two different polymers.

11. A method for making polymer-coated single-wall carbon nanotubes comprising dispersing single-wall carbon nanotubes and a polymer in a solvent by a method selected from the group consisting of mixing, sonication, heating and combinations thereof.

12. A method in accordance with claim 11, wherein the single-wall carbon nanotubes are substantially free of amorphous carbon.

13. A method in accordance with claim 11, wherein the single-wall carbon nanotubes are coated with at least two polymers.

14. A method accordance with claim 11, wherein the polymer and the plurality of individual single wall carbon nanotubes are added to the solvent sequentially.

15. A method in accordance with claim 11, wherein the polymer and the plurality of individual single-wall carbon nanotubes are added to the solvent simultaneously.

16. A method in accordance with claim 11, wherein the solvent comprises water and the polymer is water-soluble.

17. A method in accordance with claim 11, wherein the solvent further comprises a surfactant.

18. A method in accordance with claim 11, wherein the concentration of single-wall carbon nanotubes in the solvent is between about 0.1 grams/liter and about 5 grams/liter.

19. A method in accordance with claim 11, wherein the concentration of polymer in the solvent is between about 1.0 percent and about 5.0 percent by weight.

20. A method in accordance with claim 11, wherein the solvent is heated to a temperature at least about 40 °C.

21. A method in accordance with claim 11, wherein the solvent is heated to a temperature of between about 50 °C and about 60 °C.

22. A method in accordance with claim 11, wherein the solvent is heated between about 0.1 hours and about 100 hours.

23. A method in accordance with claim 11, wherein the solvent is heated between about 1 hour and about 50 hours.

24. A method in accordance with claim 11, further comprising the step of extruding the polymer-wrapped nanotubes with a second polymer to form an encapsulated nanotube-polymer composite.

25. A method in accordance with claim 11, further comprising the step of removing the polymer coat from the nanotubes by contacting the coated nanotubes with a solvent having a low surface tension.

26. A method in accordance with claim 25, wherein the solvent comprises a chlorinated hydrocarbon.

27. A method in accordance with claim 11, further comprising the step of aligning the nanotubes by application of an external field selected from the group consisting of an electrical field, a magnetic field and a shear flow field.

28. A method for making polymer-coated aggregates of single-wall carbon nanotubes comprising dispersing aggregates of single-wall carbon nanotubes and a polymer in a solvent by a method selected from the group consisting of mixing, sonication, heating and combinations thereof.

29. A method in accordance with claim 28, wherein the aggregates of single-wall carbon nanotubes comprises ropes of single-wall carbon nanotubes which are substantially aligned along their longitudinal axes.

30. A method in accordance with claim 28, wherein the aggregates of single-wall carbon nanotubes comprises bundles of single-wall carbon nanotubes which are substantially aligned along their longitudinal axes.

31. A method in accordance with claim 28, wherein the aggregates of single-wall carbon nanotubes are coated with at least two different polymers.

32. A method in accordance with claim 28, wherein the single-wall carbon nanotubes in the aggregates are substantially free of amorphous carbon.

33. A method accordance with claim 28, wherein the polymer and the aggregates of single-wall carbon nanotubes are added to the solvent sequentially.

34. A method in accordance with claim 28, wherein the polymer and the aggregates of single-wall carbon nanotubes are added to the solvent simultaneously.

35. A method in accordance with claim 28, wherein the solvent comprises water and the polymer is water-soluble.

36. A method in accordance with claim 28, wherein the solvent further comprises a surfactant.

37. A method in accordance with claim 28, wherein the concentration of the aggregates of single-wall carbon nanotubes in the solvent is between about 0.1 gram/liter and about 5 gram/liter.

38. A method in accordance with claim 28, wherein the concentration of the polymer in the solvent is between about 1.0 percent and about 5.0 percent by weight.

39. A method in accordance with claim 28, wherein the solvent is heated to a temperature at least about 40 °C.

40. A method in accordance with claim 28, wherein the solvent is heated to a temperature of between about 50 °C and about 60 °C.

41. A method in accordance with claim 28, wherein the solvent is heated between about 0.1 hours and about 100 hours.

42. A method in accordance with claim 28, wherein the solvent is heated between about 1 hour and about 50 hours.

43. A method in accordance with claim 28, further comprising the step of extruding the polymer-wrapped aggregates of single-wall carbon nanotubes with a second polymer to form a composite of single-wall carbon nanotube aggregates.

44. A method in accordance with claim 28, further comprising the step of removing the polymer coat from the polymer-coated aggregates of the single-wall carbon nanotubes by contacting the polymer-coated aggregates of single-wall carbon nanotubes with a solvent having a low surface tension.

45. A method in accordance with claim 44, wherein the solvent comprises a chlorinated hydrocarbon.

46. A method in accordance with claim 28, further comprising the step of aligning the polymer-wrapped aggregates of single-wall carbon nanotubes by application of an external field selected from the group consisting of an electrical field, magnetic field, and shear flow field.